Figure 1a. A general mixture synthesis with fluorous tags using a mixture of tagged compounds.

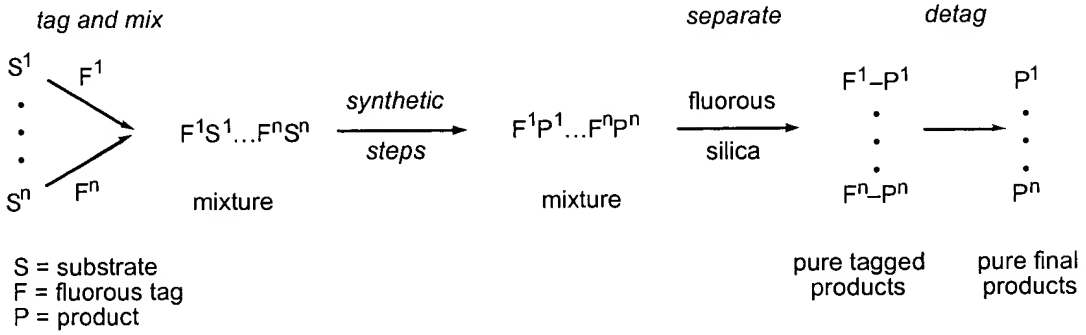


Figure 1b. A general mixture synthesis with fluorous tags using a mixture of tagged compounds and a mixture of reactants.

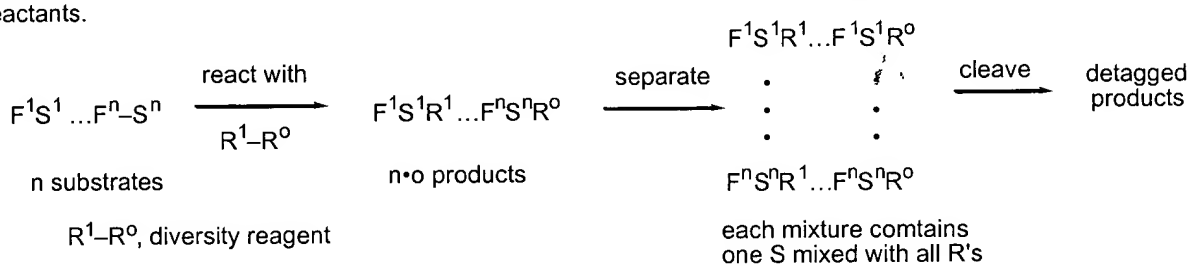


Figure 1c. A general mixture synthesis with fluorous tags using fluorous tagged reactants and a substrate.

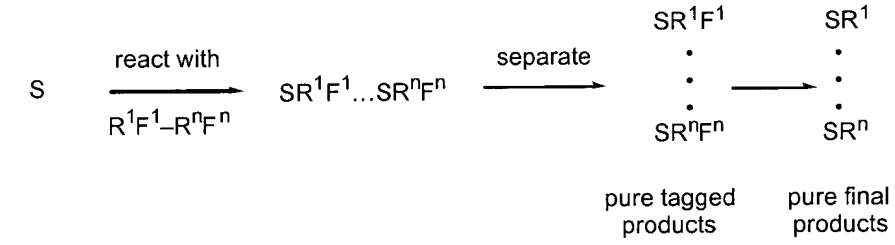
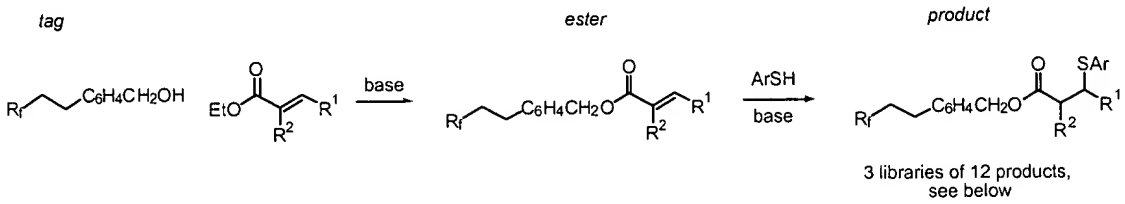


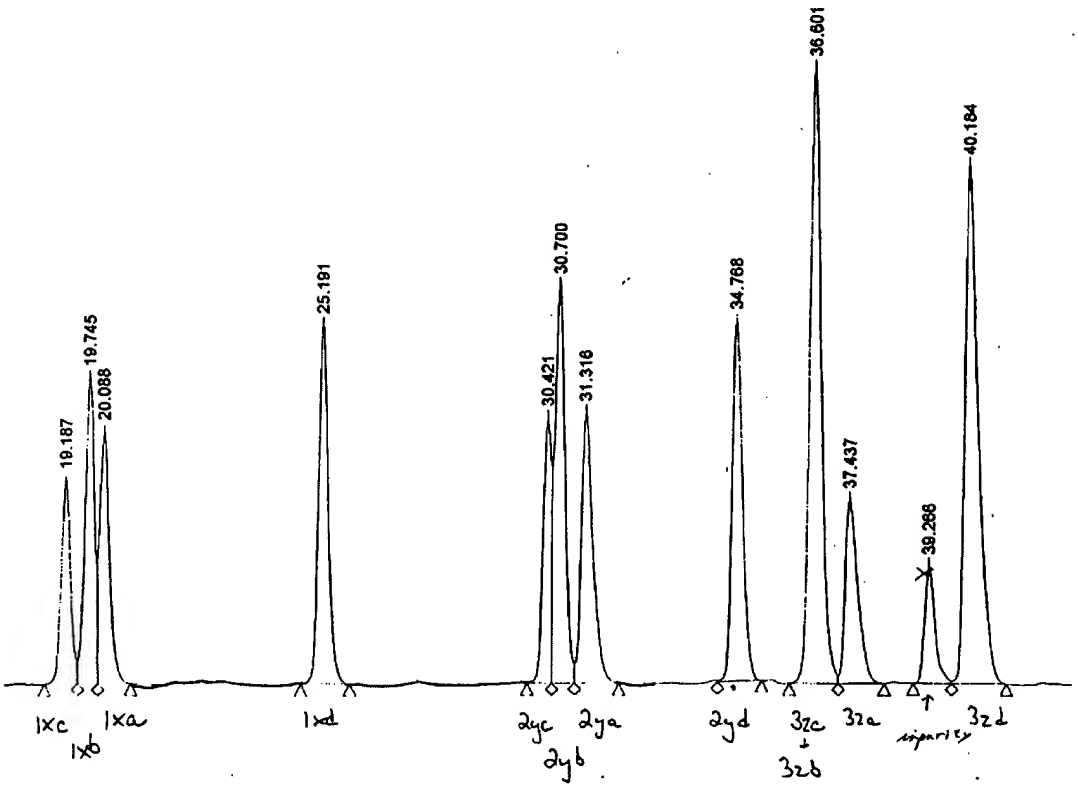
Figure 2. A representative example of a synthesis with a mixture of flourous tagged compounds and a mixture of reactants



Tags		Esters			Thiols
	R^f		R^1	R^2	
x	C_6F_{13}	**1**	Me	H	**a** C_6H_5
y	C_8F_{17}	**2**	Pr	H	**b** 2-naphthyl
z	$C_{10}F_{21}$	**3**	H	Me	**c** p-$MeOC_6H_4$
					d p-$^tBuC_6H_4$

Library	Esters	Products in order of retention times (min) on Fluofix column
1	**1x**, **2y**, **3z**	**1xc** (18.5); **1xb** (18.9); **1xa** (19.3); **1xd** (23.8); **2yc** (28.7); **2yb** (28.7); **2ya** (29.5); **2yd** (32.6); **3zc** (34.1); **3zb** (34.1); **3za** (35.1); **3zd** (37.9)
2	**1y**, **2z**, **3x**	**3xc** (18.1); **3xb** (18.5); **3xa** (18.7); **3xd** (23.4); **1yc** (27.0); **1yb** (27.0); **1yc** (27.6); **1yd** (31.2); **2zc** (35.6); **2zb** (35.6); **2za** (36.5); **2zd** (38.8)
3	**1z**, **2x**, **3y**	**2xc** (20.4); **2xb** (20.9); **2xa** (21.0); **2xd** (25.3); **3yc** (26.4); **3yb** (26.4); **3ya** (27.0); **3yd** (30.8); **1zc** (34.2); **1zb** (34.2); **1za** (35.1); **1zd** (37.8)

Figure 3. A representative HPLC trace of a library of compounds produced in the synthesis of Figure 2.[a]



a) Retention times are listed in minutes; compound numbers refer to Figure 2; Fluofix column eluting with a gradient of 80% methanol/water increased to 100% methanol over 40 min. The peak at 39 min is an unknown impurity.

Figure 4. Preparation of Precursors for a Mixture Synthesis of Mappicine Analogs

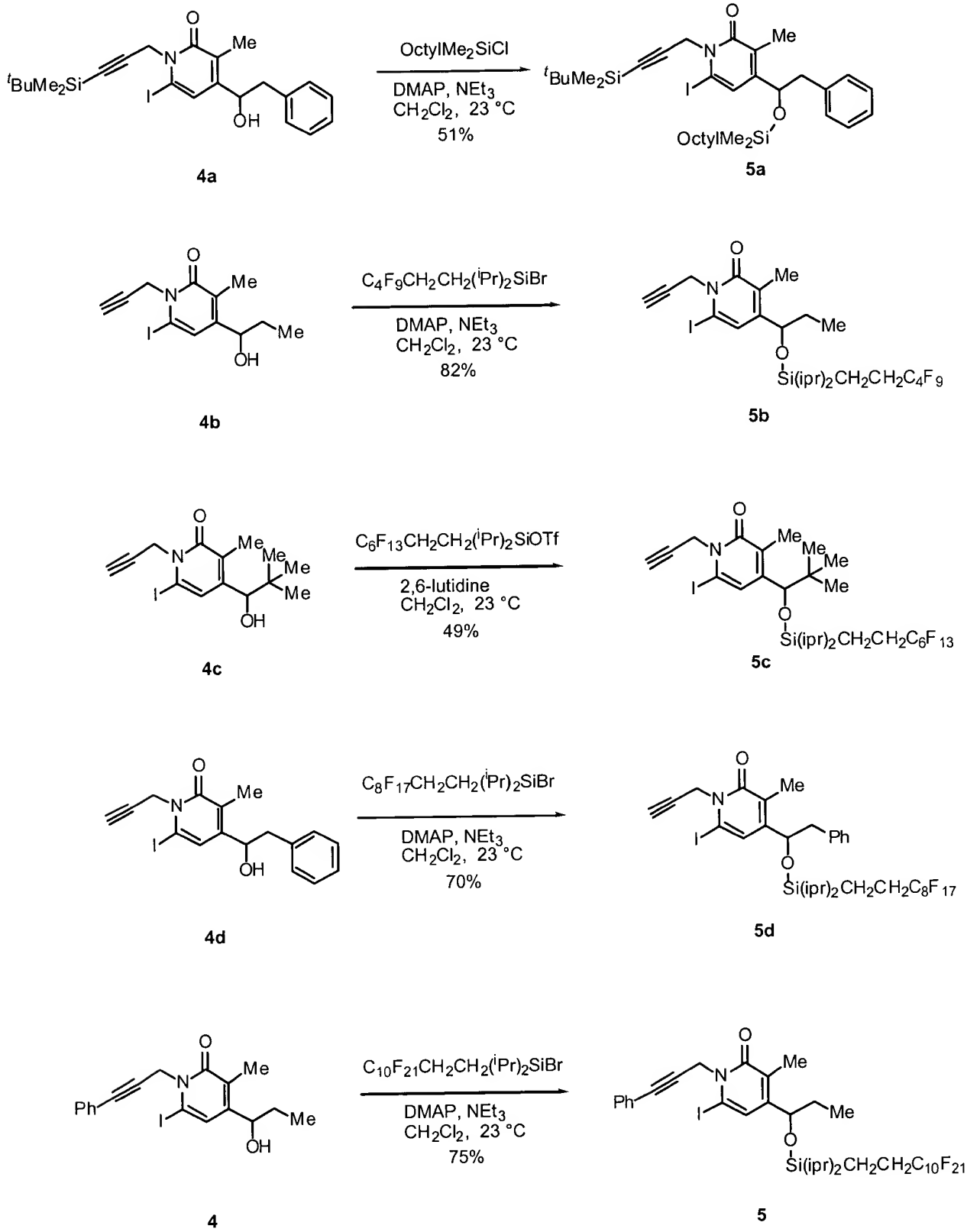
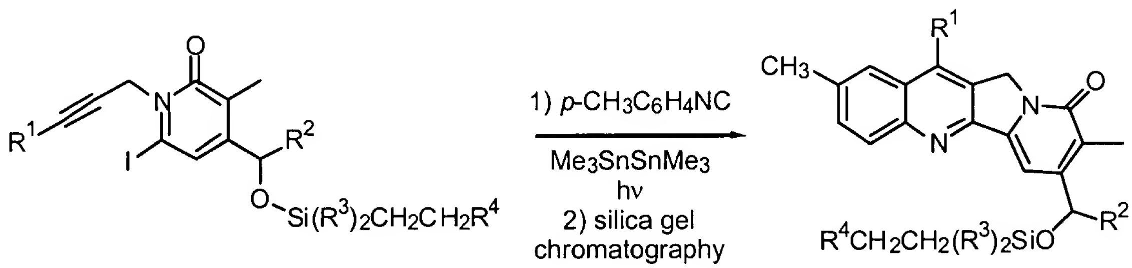


Figure 5. Mappicine Mixture Synthesis and Separation



Mixture of **5a-e**

Mixture of protected mappicines **6a-e**

	R^1	R^2	R^3	R^4
a	$SiMe_2{}^tBu$	CH_2Ph	Me	C_6H_{13}
b	H	Et	ipr	C_4F_9
c	H	^tBu	ipr	C_6F_{13}
d	H	CH_2Ph	ipr	C_8F_{17}
e	Ph	Et	ipr	$C_{10}F_{21}$

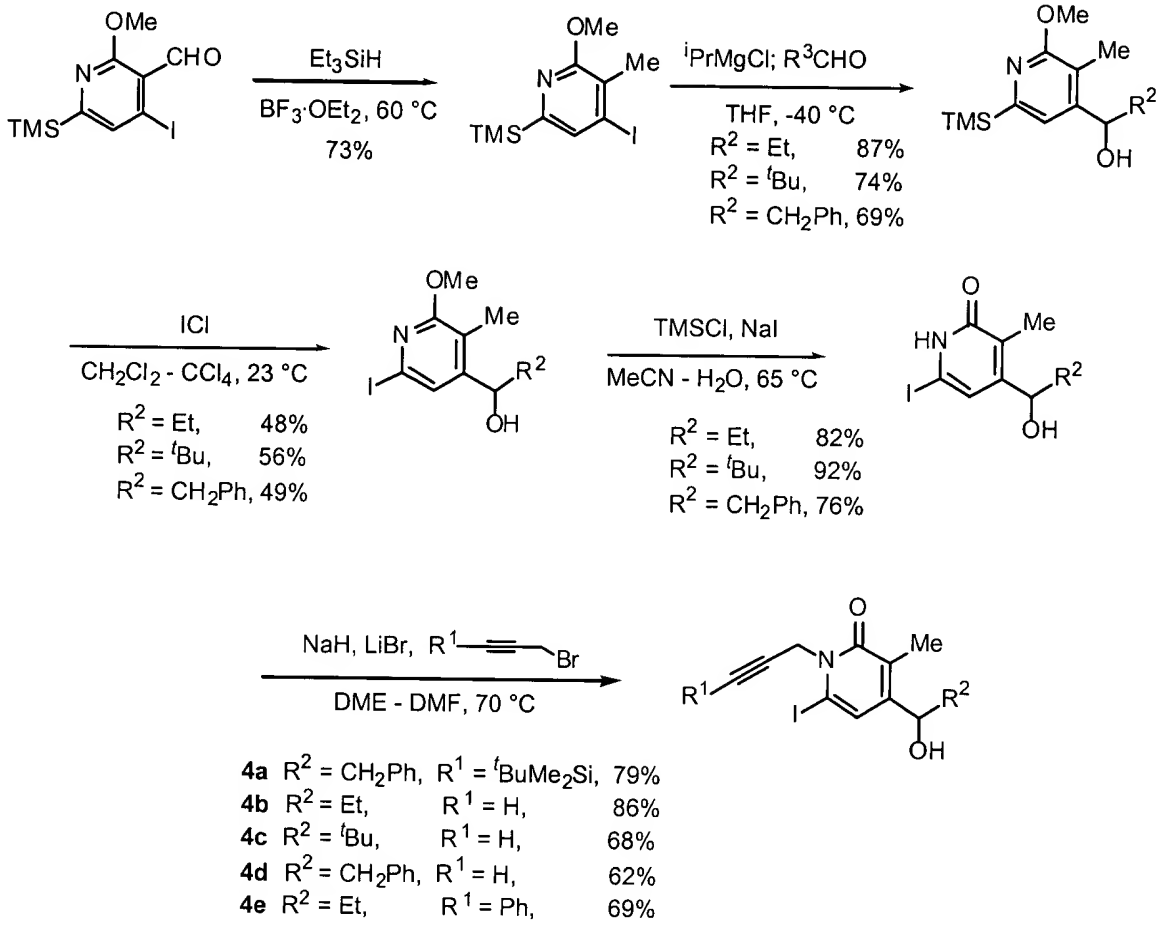
separate on Fluofix™ →

Individual, pure samples of **6a,e**

Time	Gradient
0-5 min	80% MeOH/H_2O-
5-25 min	90% MeOH/H_2O
>25 min	100% MeOH

	Retention Time	Yield
a	3 min	36%
b	13 min	41%
c	18 min	29%
d	21 min	36%
e	28 min	43%

Figure 6. Preparation of precursors for a mixture synthesis of mappicine analogs (Example 8)



4a $R^2 = CH_2Ph$, $R^1 = {}^tBuMe_2Si$, 79%
4b $R^2 = Et$, $R^1 = H$, 86%
4c $R^2 = {}^tBu$, $R^1 = H$, 68%
4d $R^2 = CH_2Ph$, $R^1 = H$, 62%
4e $R^2 = Et$, $R^1 = Ph$, 69%